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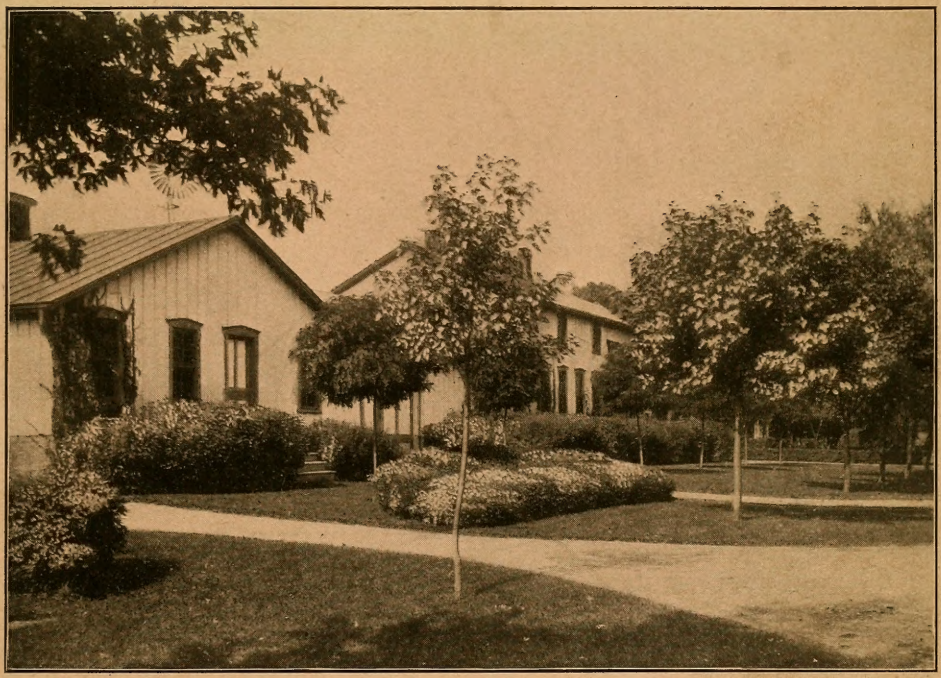
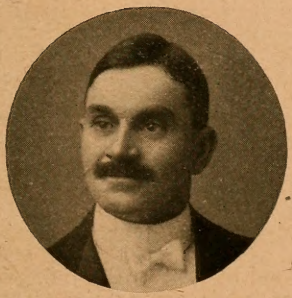
GREENING'S TWENTIETH CENTURY
Fruit Growers' and Landscapers' Guide

By CHARLES E. GREENING





Chas. E. Greening

CHAPTER 1.—Treatise on Transplanting, Soil Preparation, Pruning, &c.

CHAPTER 2.—Treatise on Care and Pruning of the Orchard . . . . . .

CHAPTER 3.—Treatise on Marketing Fruit

CHAPTER 4.—Treatise on Beautifying the Surroundings of the Home . .

CHAPTER 5.—Treatise on Tree Insects and Diseases, Spraying, &c.

Published by

The Greening Bros. Nursery Company, Monroe, Mich.

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AMERICA'S GREATEST NURSERIES.

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GREENING BROS.' HUMBLE BEGINNING IN 1883.

As poor boys we started our modest beginning in 1883. We lacked money, experience, knowledge and education. We had an inheritance of honesty, uprightness, energy, alertness, and a willingness to learn and work, and above all a profound confidence in our ability. We think our achievements show a wonderful possibility "to win in open competition."

To Our Patrons and the Public:

We are almost daily besieged with questions relating to **Planting, Pruning, Cultivation, Soil, Spraying, Gathering, Marketing, Planting the Lawn, Trees, Plants,** etc. Inquiries have been constantly increasing from year to year in the progress of our business until, finally, we are brought face to face with the problem of preparing a work which will cover the questions usually asked. To furnish this information in a concise and convenient form, the author has prepared with much care this work, entitled **"Greening's 20th Century Fruit Growers' and Landscapers' Guide."** The information herein contained is gathered from a life-long experience in nursery work and fruit growing and can be referred to with utmost confidence. In the preparation of this "Treatise" the writer has been guided largely by his own personal experience and knowledge, and the information gathered in becoming associated with prominent horticulturists while giving lectures on topics relating to horticulture. It is written in the plainest of language, so that any person of ordinary intelligence can read and thoroughly understand it. We believe that no apology is due for the use of so many pictures, which are not only very beautiful, but which also furnish material for study to any one interested in horticulture.

FOR THE OVERWORKED BUSINESS AND PROFESSIONAL MAN, for people living in crowded cities, and for all who need nature's remedies to build up a broken-down constitution, nothing offers more real health-giving enjoyment, recreation and fun than a country home, lined and dotted with beautiful trees and shrubbery; an orchard or a garden of choice fruits—the food of God's own giving—the free use of ripe, fresh fruits; a stroll out in the open air among the trees, where nature's alteratives and sedatives are abundantly supplied. To those, this book will be a welcome guest in its handy and condensed form.

FOR FRUIT GROWERS AND FARMERS this book will lead the way to success in fruit growing, and spare them much worry when in need of advice. It will save them many costly experiments, and will help to increase their profits. The latest methods and practical ideas are brought out; many practical and useful hints are presented, boiled down to occupy the least possible space, for busy people to read.

The Greening Bros. Nursery Co., Monroe, Mich.

NURSERYMEN. FRUIT GROWERS. HORTICULTURISTS. PUBLISHERS.

A MODEL ORCHARD OF GREENING'S TREES.

Mr. Henry Flater, of Findlay, Ohio, is the proud possessor of the orchard above shown. It was planted in 1898, and consists of rows of apple trees with peaches planted in between. Attention is called to the almost perfect form of the trees, a result of pruning from the beginning under our system explained in our *"Treatise on Orcharding."* All of the trees in the orchard are from our nursery. Notice the splendid system of pruning and heading-in for a well-balanced crown and substantial framework of the branches to carry a heavy crop of fruit.

Greening's Twentieth Century Fruit Growers' and Landscapers' Guide

By CHARLES E. GREENING

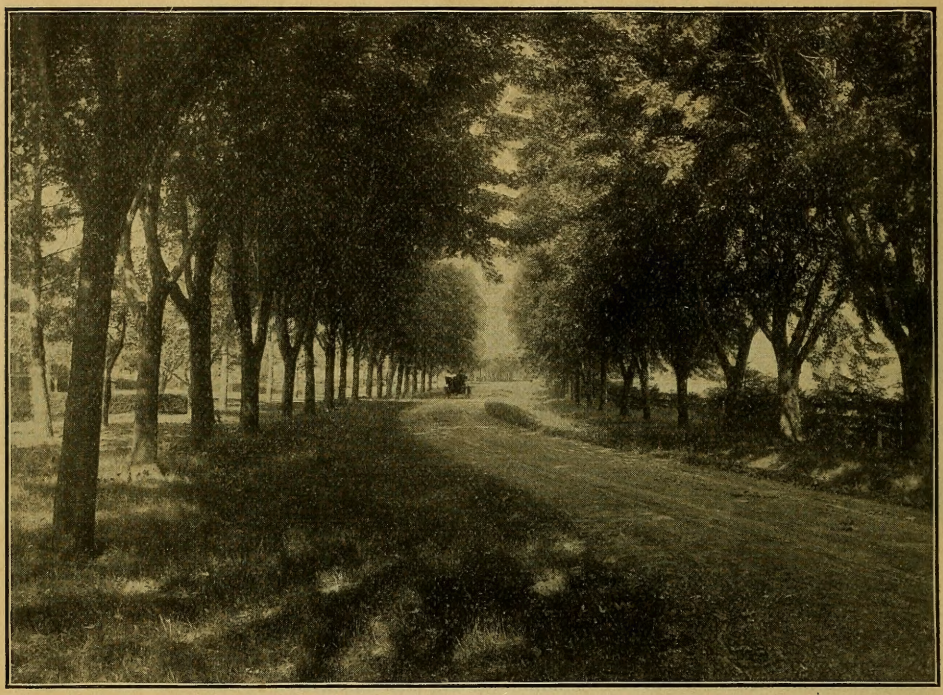
Chapter One — TREATISE ON TRANSPLANTING, SOIL PREPARATION, PRUNING, &c

Preparation of Soil Before Planting

In the preparation of soil for an orchard, let us first give attention to improving the condition of the soil. In the first place, let it be put down as a settled fact that stable manure is the only all-round and most perfect fertilizer that can be found. It should be applied freely and turned under before planting. A green crop turned under, such as peas, corn, buckwheat, cow-peas or clover, will be found of inestimable benefit. Soils rich in plant food, such as new land, old meadows or pasture lands, require little if any manure at planting time; such lands should, if possible, be planted to hoed crops the year before. The orchard being planted for a lifetime, care in preparing the soil and selecting land adapted for the purpose should not be overlooked. Work the land deep and thoroughly before planting. If in a yard where a plow cannot be used, have the ground spaded deep for several feet around, and mix in with the soil some thoroughly rotted manure. Drainage on wet soils is necessary; orchard trees will not thrive on wet lands.

Selecting a Site for an Orchard

In the matter of selecting a site for one or more kinds of fruit, the question of soil and location is of prime importance. An elevated location having good surface and air drainage is in most instances preferable to level lands. Underdrainage on level lands is necessary for good results, and makes the soil loose, fertile and warm. It is a mistake to plant fruit on low, wet lands. Apples, peaches, plums, quinces and cherries succeed best on a gravelly or light soil, while pears and grapes will do best on heavy soil.



GREENING'S SILVER MAPLE AVENUE.

In our untiring ambition and passionate desire to improve and beautify our surroundings, we have not overlooked the public highway, and have paid out thousands of dollars for the improvement of the roads leading from the nursery to the city. About one mile of macadamized road, consisting of eighteen inches thickness of crushed stone, is largely the creation of our purse and enterprise. This avenue shown in the picture is the pride of the nursery. We do not know of a tree better adapted for roadside planting than the Silver Maple, if headed in occasionally while young.

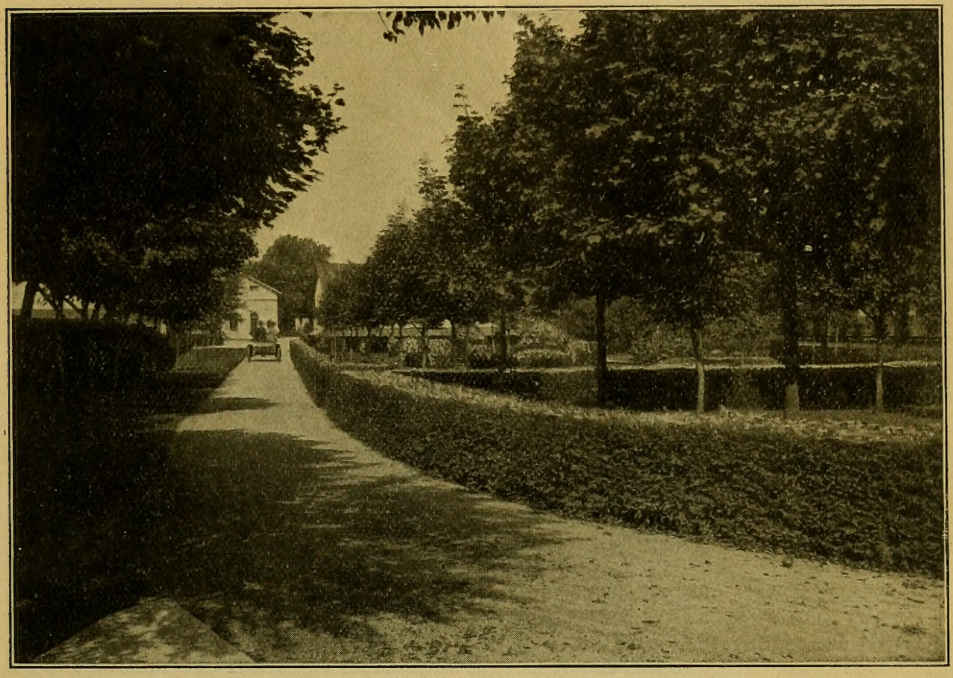
Varieties to Plant

The selection of varieties is very important. Mistakes in selecting varieties have been made by the best and most experienced fruit growers. It is well to observe and profit by the experience of others. With most varieties it is purely a question of locality and soil. Experience in many things is the best teacher. We must make use of the experience of others, who have gone over the road and paid the bills for such experience. In planting an orchard for market, it is well to consult for advice those who have experience and knowledge, observing carefully the success and failure of varieties fruiting in your vicinity. It is also well to consult a reliable nurseryman, and in this connection we cheerfully offer our services. Our extensive Experimental Orchards, our wide range of experience and knowledge in growing fruit for market, enable us to give good advice to planters. We will answer all questions in this respect honestly and fairly. Planters may consult us with the utmost confidence.

The Best Trees to Plant

The best trees to plant, irrespective of climate and location, are such as are grown in a cool and temperate climate. The great State of Michigan is noted far and wide for its cool, moderate and healthy summer climate, making it the most popular health resort of the Northern States; also for its great fruit growing industry. Being surrounded on three sides by the waters of the great lakes, it has the most favorable climatic conditions for the growing of hardy and healthy nursery stock. Trees grown in this climate are hardier and better adapted for transplanting than those grown in milder climates, and will make lasting and profitable orchards.

It is sharper than a serpent's tooth to have a thankless child,



A CHARMING SCENE.

This photograph presents a scene of beauty such as is seldom seen. A section of our parks, showing fine Norway Spruce and Arbor Vitæ hedges, graceful and well kept driveways, Norway maples, groups of hardy flowering shrubbery, etc. These improvements will appeal to every owner of a home.

Distances for Planting

Apples	30 to 35 feet apart.
Pears, Standard. . .	16 to 20 feet apart.
Pears, Dwarf.	12 to 16 feet apart.
Cherries	16 to 20 feet apart.
Plums	16 to 20 feet apart.
Peaches	16 to 20 feet apart.
Quinces	12 to 16 feet apart.
Apricots	16 to 20 feet apart.
Grapes	8 feet apart.
Gooseberries	4 to 6 feet apart.
Currants	4 to 6 feet apart.
Raspberries, Red. . . .	2 x 7 feet apart.
Raspberries, Black. .	3 x 7 feet apart.
Blackberries	3 x 7 feet apart.
Strawberries	1 x 4 feet apart.

Number of Trees and Plants to an Acre

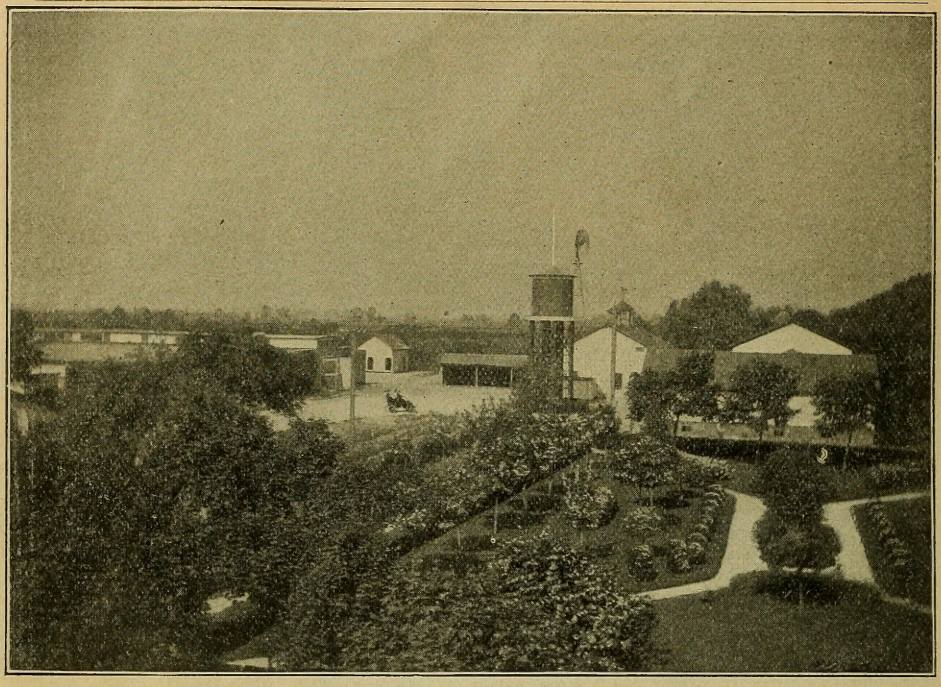
At 4 feet apart each way.	2723
At 5 feet apart each way.	1742
At 6 feet apart each way.	1210
At 8 feet apart each way.	681
At 10 feet apart each way.	435
At 12 feet apart each way.	302
At 16 feet apart each way.	170
At 18 feet apart each way.	134
At 20 feet apart each way.	109
At 25 feet apart each way.	70
At 30 feet apart each way.	50
At 33 feet apart each way.	40

Care Before Planting

Immediately after receiving your trees or plants from the nursery, moisten thoroughly and wrap or cover to prevent drying out. Bring them home at once and heel in without delay. Cover all the roots good and deep and moisten the soil if necessary. Strawberries, raspberries and blackberries should be kept in cellar well dampened until ready to plant. Do not permit the stock to become injured by exposure at any time before planting.

Root Pruning Before Planting

The roots of trees, grapevines, gooseberries and currants should be carefully pruned before planting. Use a sharp knife and remove all the broken and bruised roots. Cut back all roots from the under side, leaving roots from six to ten inches in length. With most of our ornamental trees, and especially evergreens, as little root area should be cut away as practicable.



GREENING'S FORMAL HORTICULTURAL GARDENS.

These gardens represent a perfect dream of beauty and elegance. They are the admiration of the most fastidious visitor, the ideal of the beautiful in tree, lawn, shrub, hedge, etc. The artistic arrangement of grounds and buildings, beautiful parks, handsome avenues, fine driveways and walks, our excellent system of waterworks, and numerous other things to be seen at the nursery, give an impressive example of what human energy and American spirit may accomplish in the course of a few years. These gardens mark the place where only a few years ago was a wet ravine with rail fences, burdocks, and a wild undergrowth of brush. It required thousands of loads of good soil and much thought and expense to resurrect it from a wilderness to its present condition.

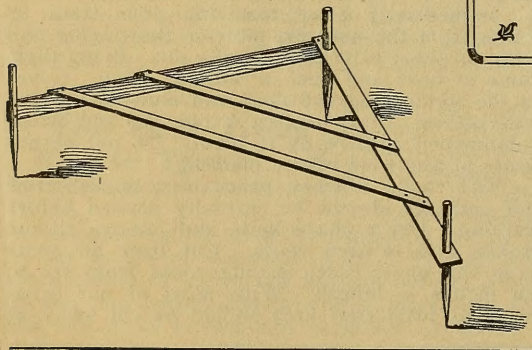
Crown Pruning at Planting Time

The work of pruning the tops of trees may be done either before or after planting. If done after planting, care should be exercised not to loosen the trees in the ground. We advise top pruning of **grapes and small fruits** after planting.

Pruning Apple, Pear, Plum and Cherry. Prune off all branches except the upper three or four; these cut back to spurs about six inches in length. Good judgment is necessary in selecting branches for the crown, such as will form an evenly balanced head.

Pruning Peach Trees. Cut back the entire top to three feet from the ground after being planted; prune off all branches, leaving four or five spurs of about two inches at the top. In other words, trim to a straight whip with a few spurs at the top, two inches long. Peach trees of smaller grades should be headed six inches lower.

The Planting Square



A wooden square is made out of fence boards eight feet long, dressed and perfectly straight, and these are nailed so as to form a true triangle. No matter what the shape of the field is, always begin staking out on a true square, and for this purpose the planting square will be of excellent service. By sighting across the field over the stakes on the planting square, a perfect square of the orchard is obtained.

The classical garden is governed by special laws of harmony and rhythm.

GROUP OF NORWAY MAPLES—(Greening's Park.)

Among the beauties of our grounds are a cluster of Norway Maples, planted near the residence of C. E. Greening, for shade. A charming place under these trees of perfect form and elegance, where through its leaves you may scan nature's canopy in rapt tranquility.

Staking Out the Orchard

After the field has been squared up and stakes placed at each corner of the field, stretch a rope or strong wire from stake to stake around the outside, staking the distances the trees are to be planted along the wire, and proceed in this way until you get around the field. The wire line is the most practical, as it will not stretch. The most practical way of using the wire line is to have a rim soldered at such distances apart as it is desired to plant, all along the wire, and in staking out, drive a stake exactly at each rim.

Heeling In Before Planting

Dig a trench fifteen to eighteen inches deep, loosen the lower band of a bundle, wet the trees thoroughly, place them into the trench and cover carefully, pressing the ground down with the foot. Trees which are received in the fall for spring planting, should be heeled in during the winter eighteen inches deep, placing the trees at an angle of forty-five degrees, opening up the bundles and being careful to fill the soil well in among the roots. The trees thus heeled in should be well banked up over winter and planted out early in the spring. For heeling in over winter select a place where water will not stand, away from buildings and meadows, out in the open field, where mice will not injure them. Heeling in over winter applies to tender trees and plants, especially peach trees. At least two-thirds of the bodies should be covered. Cover trees after heeling in, with evergreen boughs if obtainable. Some fruit growers prefer fall shipment, and heeling in over winter; the advantage claimed is in having the stock for very early spring planting. We recommend spring delivery and planting, because we can guarantee to bring the trees to the planter as early in spring as it is advisable to plant.

An orchard without Banana apples is like a Yankee dinner without pie—incomplete.

A BLOCK OF BANNER PEACH TREES.

Here we show a block of peach trees, representing five months' growth from bud, of salable size, all pruned up ready to be dug with the steam digger. In this climate peach trees make a strong, hardy, healthy growth, and ripen up their wood early in the fall. Insects and fungous diseases on peach trees are things unknown in this locality. The most scrupulous attention is given the varieties so as to have them pure and true to name. A new method of pruning has a tendency to make the body smooth and symmetrical; all have straight leaders and in this respect are above comparison with Eastern or Southern grown peach trees, which are frequently very forked, crooked and knotty. The trees shown are of the Banner variety, a peach ripening after Late Crawford, and which has very superior qualities over other late ripening varieties. See colored illustration and description.

The Planting Board

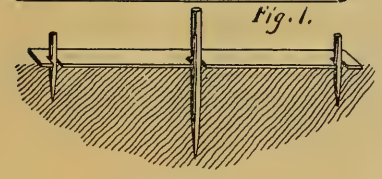


Fig. 1.

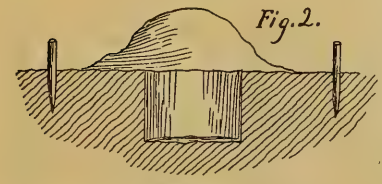


Fig. 2.

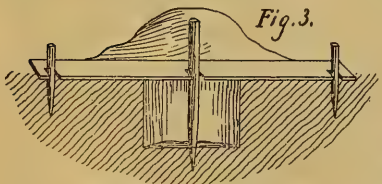


Fig. 3.

This is a board six inches wide and about five feet long, notched as shown on the picture. The purpose of the planting board is to prevent the orchard from being planted out of square. In digging the hole place the board at the middle notch against the stake, and drive small stakes in end notches as shown in Fig. 1. Next remove board and dig the hole, leaving end stakes in place, Fig. 2. After the hole is completed replace the board in two end stakes, placing the stake in position as shown in Fig. 3. The idea in using this device is to get the stake exactly in the place where it stood before digging the hole. In plant ing, set trees close against the stake, and always on the same side of the stake throughout the field, and your orchard will be perfectly straight in every direction.

Planting the Trees

After the soil is well prepared, a hole should be dug large enough to admit the roots in their natural position, say two feet square and twenty inches deep. The earth to fill in and about the roots should be well pulverized; then fill the hole with loose earth so as to bring the tree about an inch lower than it stood in the nursery; place the tree in position, fill in fine mellow soil between and around the roots with the hand, arranging all the roots in their

BLOCK OF WHOLE-ROOT TWO-YEAR-OLD CHERRY TREES.

Constantly having in mind the growing of the best that the judicious expenditure of time and money can bring forth, we have given some attention to the study of fruit tree seedlings used in our business for propagating. As a result of our experiment, we have selected from among the various species of cherry seedlings the "Mahaleb," noted for its hardiness, vigor of growth and strong fruiting power. In the illustration above will be noticed a strong, thrifty growth, such as is rarely seen in a nursery. Whole-root Mahaleb seedlings of strong caliber were used in this block. The soil is a heavy black loam, underlaid with a porous clay subsoil, very rich, thoroughly underdrained, and eminently adapted for growing trees. This is supplemented by a perfect system of spraying for the prevention of any possible fungus and the destruction of insects. Can there be any doubt as to our ability to grow good trees under such circumstances?

natural position and packing the soil carefully around them. Fill to the top and press down the earth around the tree with the foot; throw a bucket of water around each tree to settle the ground, and scatter a little soil on top to prevent baking. **Spring Planting**—Level the soil around the tree after spring planting. **Fall Planting**—Bank up against the tree after fall planting, and remove to a level in spring. **Mulching**, with a covering of straw manure or leaf mould after planting, is highly beneficial and will often save the tree in dry seasons. Dwarf Pear should be planted four or five inches deeper than they stood in the nursery.

Planting Grape Vines

Plant 8x8 feet apart for trellis and 6x8 feet for stake culture. Dig holes same as for trees. Place the vine in the hole so that the first bud next to the stem will come on a level with the surface; spread the lower layer of roots in their natural position, fill in the earth and press down the soil firmly with the foot; then spread the second layer of roots, fill in the balance of the hole and press gently with foot. After planting trim the vine back to two buds. A strong stake four feet long should be driven in at each vine to support the canes the first two years.

Planting Small Fruits

The soil should be mellow and rich. Plant Red Raspberries 2x7 feet apart; Black Raspberries, Blackberries, Dewberries, 3x7 feet apart. Conrath and Columbian Raspberries, on account of their vigor of growth, should be planted 4x8 feet apart; Currants and Gooseberries, 4x6 feet apart; Strawberries for field culture, 1x4 feet, and for garden, 2 feet apart. Plant small fruits about one inch deeper than they stood in the nursery, except strawberries, which should be planted so as to leave the crown even with the surface—too deep planting will smother the plant. Spread the roots, in planting small fruits, as much as possible, and press the earth over the roots firmly with the hand. If planted in the fall, cover with coarse straw manure to prevent the plants from being heaved out during the winter. After planting, cut back the tops to four to five inches from the ground.

THE STABLES.

These buildings embody every convenience of a first-class stable. There are separate apartments for carriages, automobiles, harnesses, etc. A well bred stock of horses is kept. Gas and water is supplied by our own plant. Conspicuous in the picture is the attractive front. Fine beds of hardy flowering shrubbery are planted up against the buildings, which gives a very fine effect during the summer months. The main entrance to the nursery grounds is shown herewith, laterals leading off in different directions. All of our driveways and roadbeds are constructed of crushed stone and covered with stone screenings.

Planting Ornamental Trees

Plant same as fruit trees, except that larger holes should be dug to accommodate the roots. The ground should be pressed down firmly over the roots with the foot. Two-thirds of the tops should be cut off on all ornamental trees, except Cut-leaved Birch and Horse Chestnuts, which should not be headed in. Care should be taken to prune the tops so that the trees will make a well balanced and uniform top. The forming of the crown is regulated entirely by the pruning. On some kinds of trees it may be necessary to tie the tree to a strong stake to hold it firmly in its place. Wrap the trunks of Maples with building paper, four or five feet from the ground up, to keep out borers. Irrigate in dry seasons.

Evergreens

Soak the ground thoroughly after planting, and apply a thick covering of straw manure over the surface, around the tree, to retain moisture in the soil. Shade the trees with cloth, burlap or paper to prevent the hot sun from striking the tree, for the first two or three weeks, or until the tree starts to grow.

Planting and Pruning Shrubbery and Roses

Make the soil rich by applying well rotted barnyard manure, which should be worked in with the soil. Trim off all the ends of roots; plant shrubbery two inches and roses three inches deeper than they stood in the nursery, pressing the ground firmly over the roots. Cut back tops on roses, leaving four inches above ground. On shrubbery trim up lower branches so as to form a well balanced head, and cut back one-half of top. All sprouts growing out of the ground on roses should be removed as soon as discovered, and should be cut close to

LARGEST SHIPMENT OF TREES ON RECORD.

The largest shipment of fruit trees ever made in the world was made by us on April 2nd, 1903. The shipment consisted of thirty-two furniture cars filled to the top with Greening's trees, all packed in bulk, each order being separated with rope partitions. The entire train load, consisting of about 263,000 fruit trees, largely peaches and apples, went to points along the fruit belt of Michigan. This picture was taken while the train was pulling out of our siding leading from the M. C. R. R. track to our packing cellars, a distance of over one-half mile. Thus we demonstrate the magnitude of our facilities in the handling and shipping of trees.

the stalk so as to prevent further sprouting. This is very important, as the wild sprouts if allowed to grow up will smother the grafted part. Cover roses during the winter with leaves or straw. Cut back hardy Hydrangeas severely each year; other shrubbery trim out the old wood and head in to suit your taste each year. For best results trim several times during the growing season to obtain compactness and shape desired.

Chapter Two — TREATISE ON CARE AND PRUNING OF THE ORCHARD

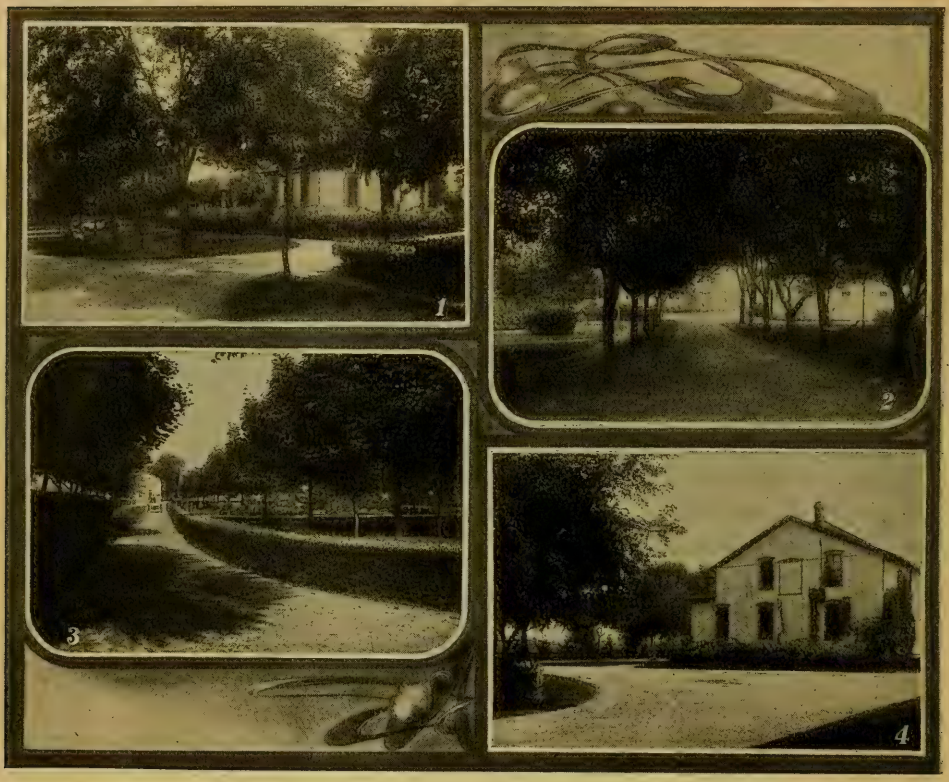
Practical Hints

Cultivation. Cultivate your orchards at given times, just the same as you do your corn, potato or root crops. Cultivate to force the tree as hard as possible the first three years. After the third year avoid cultivating deep. Plow shallow in an orchard; not over four or five inches deep, for if you turn up many roots it means injury. Keep free from weeds and farm stock.

Crops to Grow in an Orchard; What and When. Hoed farm crops, such as corn, beans, potatoes, tobacco, etc., may be grown the first two years, in a peach orchard; the first three years in a plum and cherry orchard; the first three or four years in a pear and quince orchard, and the first five or six years in an apple orchard. Orchards should not be seeded to grass. Cropping orchard land exhausts the plant food in the soil. Exceptions should be made to the above where the soil is in poor physical condition, when it should be improved by keeping out all farm crops and applying manure to enrich the soil. **Keep out all farm crops from bearing orchards.**

Winter Cover Crop. Sow oats during August and plow under the following spring.

Implements. A disc or spring-tooth harrow seems to be about the best all-round implement to use during the growing season, especially on light soil. During the dry season use a tooth harrow, and go over the ground as often as once a week to prevent evaporation of moisture in soil. A man with a harrow and team can go over a large space in a day, and keep down the weeds in a large orchard



A STUDY IN THE SCIENCE OF THE BEAUTIFUL.

These pictures represent one of the loveliest aspects of our home grounds. Imagine a space over one thousand feet in length artistically arranged with walks and driveways, rare plants and trees. Fig. 1 shows a banking of mixed shrubbery planted up against our office building, also a corner of an evergreen hedge just visible. Fig. 2 shows a charming avenue of Norway maples along each side of the driveway leading from the residence to the stables. Fig 3 shows a gracful curve in a driveway lined with an evergreen hedge on one side and Norway maples on the other. Fig. 4 shows a banking of lilacs planted up against one of our buildings, also a junction of macadam driveways branching out in several directions.

at a small expense if worked at the right time. In heavy soils, shallow plowing in the fall is very essential. Harrow and work crosswise and lengthwise. Use a hoe around the trees.

Manuring. In bearing orchards liberal manuring is advised. Barnyard manure stands in the lead as an all-round fertilizer. For peaches, cherries, and plums a fertilizer rich in potash and phosphoric acid is best. **Ashes** in sandy soils, or on lands deficient in potash, are of greatest value. They should be spread broadcast over the surface and harrowed in. The value of ashes as a fertilizer for fruit crops is not being sufficiently appreciated; they are highly recommended by such authorities as Professor Bailey, and we notice that all fruit growers using them usually grow the finest fruit. Every bushel of ashes should be saved and kept in a dry place for future use. **Plowing under green crops,** leguminous plants such as crimson clover, cow-peas or field-peas, are excellent for recuperating bearing orchards. Sow crimson clover during August, work in with harrow, and turn under the crop the following season when in bloom. Sow cow-peas about June 1st and turn under in fall. Sow field-peas May 1st and turn under when ripe, allowing the seeds to grow a second crop to be turned under in fall, before frost.

The Famous California Tree Wash. Slake eight pounds of fresh lime with hot water, and thin with water so that it can be stirred nicely; add two pounds of sulphur, mixing thoroughly; take five ounces of sulphuric acid and dilute it with two-thirds water; mix the whole so as to make a thick heavy whitewash. Apply to the body and large branches with a brush. We would urge the use of this wash in orchards, as it is the most wonderful application ever discovered for producing smooth and healthy bodies.

DELIVERING A CARLOAD OF GREENING'S TREES.

We present herewith cuts showing a scene at delivery time of a carload of Greening's trees being delivered in the fruit belt. Fig. 1 shows how the orders are taken out of the car to be placed on the wagons of customers that are waiting to be loaded. Fig. 2 shows the wagons loaded with Greening's trees ready to start for home. Fig. 3. Here the customers have congregated to have their picture taken; their faces are beaming with smiles and they have expressed their sentiments regarding our trees by writing on the sign-board, "Greening's are O. K.". The glory in doing business is to have satisfied customers and here it is that we never fail.

Keep Out the Borers. Fruit trees, especially peaches, are apt to be troubled with borers. The best remedy which has come to our notice is to mound up the earth in the fall, leaving it until the following spring, then remove the mound and dig out the borer with a knife.

Spray your orchards when there is danger of their being injured by insects or fungous diseases. (See Treatise on Spraying.)

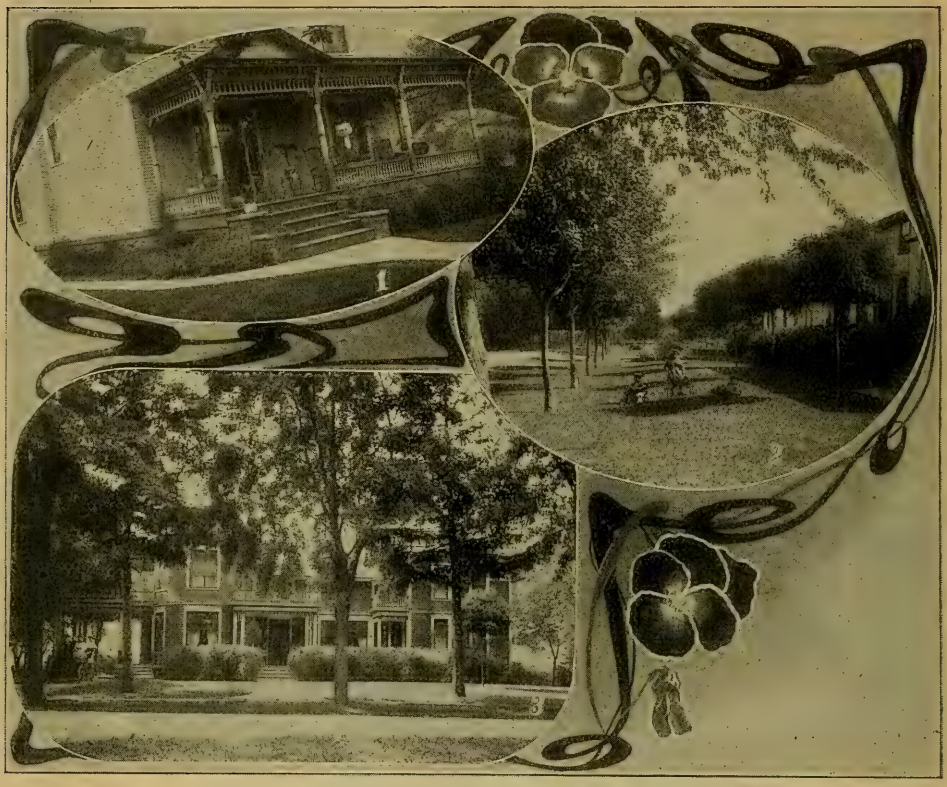
Read the North American Horticulturist published by us, and issued monthly; the most complete horticultural adviser in circulation. It is a journal on Fruit Growing and contains timely hints that are valuable. Send fifty cents for a year's subscription.

For Healing Bruised Trees. Take clay soil three parts and one part of fresh cow dung, mix thoroughly to a paste; then carve the edges of the wound with a sharp knife, so as to leave a smooth edge all around the wound. Apply the mixture about one inch thick over the wound, then bandage with cloth torn into strips.

Thinning. An important operation with a good fruit crop is to thin it. It must be done at the right time, to insure best results. It should be done on peaches and plums before the seed formation has progressed very far. Thinning increases the size of the fruit remaining, and increases the profits every time it is done right.

To Make Trees Bear. To promote fruitfulness on trees which have attained bearing size and which show no inclination of beginning to bear, the following method will be found effectual and safe: Take a sharp knife and make three circles two feet from the ground around the trunk of the tree, about four inches apart, cutting through the bark. The interruption caused in the flow of the sap will check the growth of the wood and produce the formation of fruit buds for the next season. This should be done early in July.

We should look upon plants as our garden friends.



SHRUBBERY FOR LAWN IMPROVEMENT.

The most modern idea of using shrubbery for decorating is herewith presented. Attention is directed to our "Treatise on beautifying the surroundings of a home" in this book. Many useful suggestions may be found in this treatise on how to improve the front yard. Fig. 1 shows the effect of mass groupings of Spirea Van Houtii, Globe Flower, and Barberry Thunbergii. Fig. 2 shows a row of Weeping Locust trees, also masses of mixed shrubbery, a row of Norway maples, and an open grassy place as long as two city blocks. Fig. 3 shows a mass grouping of Spirea Van Houtii in full bloom, planted up against the house, with a broad expanse of open lawn facing the street in front of our office.

When to Prune Orchards. From careful observation, and many years of actual experience, we recommend pruning orchards during March. If there is so much to be done that more time is required, begin middle of February.

Pruning Tools, How to Use. Provide yourself with a good pruning saw, a strong, sharp pruning knife, a large and a small pruning shear, and a suitable ladder. In pruning make your cut so as to leave a small shoulder below, inclining the cut inwards so as to come out even above. Many orchards are ruined by cutting the branches too close to the body, making a large and ugly wound which seldom heals over. When large branches are cut off, cover the wound with white lead paint to prevent cracking.

The Apple Orchard

Prune every year. Aim to develop and maintain a uniform, well-balanced head. Avoid cutting off large limbs if possible. Prune during March. Note the habit of the tree; if spreading in growth confine your pruning more to the side and top branches; if pyramidal in growth, thin the center and head in the top to cause spreading of the branches, so that the sun and air will have free access. Sun makes color; the richer the color and larger the size, the greater your profits. Don't prune too severely, but at the same time don't be afraid to take off where too much crowded. After a tree is planted the head should be trained in the right direction, and balanced so as to be able to carry a heavy weight of fruit without bending to the ground or breaking. We wish to impress the reader with the importance of moderately heading in the young apple orchard each year and the cutting out of all suckers and shoots which might inter-

A BEAUTIFUL PANORAMA.

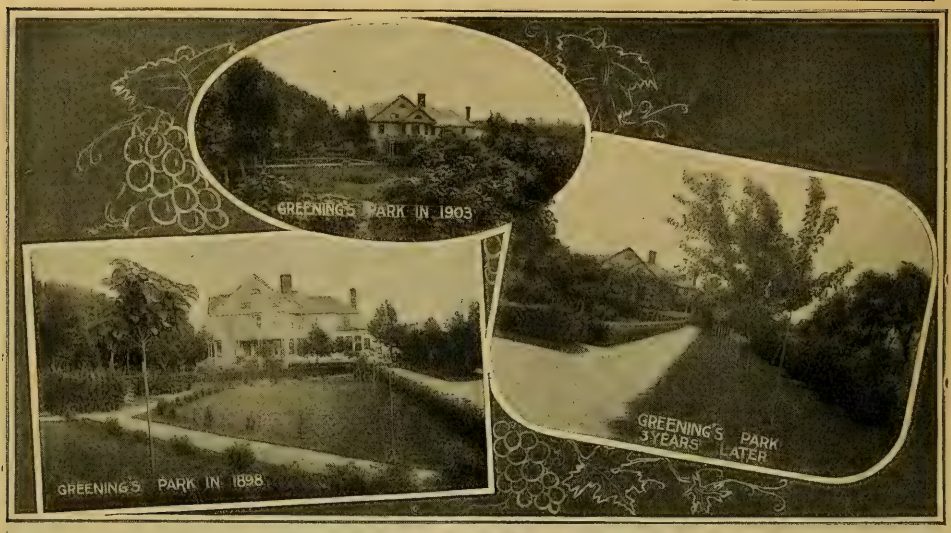
Nursery work has suggested itself to us long ago as a science and an art. The study of the beautiful in nature furnishes a wide field for science and practice to engage every power of the mind. Figs. 1 and 2 show sections of Greening's east park that simply speak for themselves. Fig. 3 illustrates some fine lawn improvements along the highway. Fig. 4 shows a graceful curve in Greening's avenue of Silver Maples.

fere with free circulation of air. It pays to thin the fruit. Fertilize to keep up the vitality and bearing power of the tree. A crop of crimson clover, field-peas or cow-peas plowed under occasionally is of great benefit to the bearing orchard. Apply ashes whenever they can be obtained. Spray for sound and large fruit. (See Spraying.) It pays to plant good varieties.

The Pear Orchard

To produce the ideal tree, pruning the first few years is the most essential point. A rule which should be remembered is to prune trees so far as possible, with a pruning knife or shear. The idea is to form the framework of the tree while young, or before it begins to bear. The first three years cut back all the leading top shoots a third or a half of the preceding year's growth. Straggly growers like Clapp's, Vicar, Nellis, etc., should be pruned from below so as to keep the branches off the ground when fruiting; at the same time the tops should be shortened in. With varieties such as C. de Nantes, Kieffer, and others of erect growth, the pruning should be confined to heading in and thinning the top. Thinning is strongly advised. Cultivate constantly, and fertilize thoroughly. Remove all the black and scaly bark on the trunk, and large branches, with a sharp knife. Cut out the black surface bark on the trunk and large branches down to the fresh under-bark; don't neglect this, as it will eventually kill the tree if left on. For market plant the C. de Nantes pear which ripens late and brings big prices. **Dwarf Pears.** Head in and prune same as Standard Pears; fertilize with stable manure. Apply the California tree wash every spring.

Let us encourage the work of civic improvement societies.



EVOLUTION IN PARK PLANTING.

The Plum Orchard

Feed the bearing plum orchard heavily with ashes and manure. Keep up the growth and vitality by constant and thorough cultivation. The plum is very likely to overbear, and it will pay to thin. Shortening in the tops, especially on young, fast growing trees, should not be overlooked each year. Japan varieties require more heading in than European sorts, usually from one-quarter to one-third of the previous year's growth. Spray for insects (see chapter on spraying). Cut out black knot and burn the affected parts as soon as discovered. We recommend the Japan varieties for profit, they are less subject to disease and insects. Our leaders are Wickson, the latest and largest of all Japan varieties, Burbank and Abundance.

The Cherry Orchard

Use ashes and stable manure for fertilizer, spreading broadcast over the ground around the tree. Avoid banking up ashes against the body of the tree, as it may injure the bark and kill the tree. Remove suckers from trunks; head in some each year while the trees are young, and thin the tops moderately. Cherries will thrive in places where other trees would fail, and will bear fine crops under conditions very unfavorable to all other kinds of fruit. They respond, however, to good cultivation and are profitable to a degree, if cared for and sprayed. Watch the slug which eats the lining off the leaves. Apply slacked lime or dry ashes to destroy slugs. We are introducing the **Brusseler Braune Cherry,** originated in Poland, which we predict will occupy front rank among profitable and fine cherries. It ripens two weeks later than other sorts now in cultivation, is of Morello type, very hardy, fruit large, of brownish red, thick meat, small pit.

The Peach Orchard

For a commercial peach orchard, climate, location, and especially the elevation should be carefully considered. Low lands will seldom produce good marketable fruit. High elevation with good air and water drainage have always shown the best paying results. While we would not advise planting on very heavy clay soil, yet we find that peaches can be grown successfully on almost any kind of soil that will produce a good farm crop. Most varieties of peaches prefer a light soil, while a few varieties seem to succeed best on a heavy soil, hence it is well for those planting on a large scale to make a careful study of these conditions. We recommend thorough cultivation of the orchard during the entire growing season up to about September 15th. Cultivate and fertilize to get a good healthy growth of wood and a well matured development of fruit buds during the growing season. Losses and failures often occur simply on account of stopping the cultivation too early in the season, causing the fruit buds to mature early in the season, and when later on there are warm rains and high temperature, as is frequently the case during October, the fruit buds will swell only to be killed by the first heavy frost. We do not recommend summer pruning except to remove

SOME OF OUR SURROUNDINGS.

the suckers from trunk and large branches. The proper time for pruning is the latter part of February and during the month of March. The matter of pruning is of prime importance in a peach orchard. Your profits largely depend upon it. Some varieties require a different method of pruning from others. Every grower should aim to study the habit and peculiarity of varieties and prune accordingly to obtain the best results. Our method of pruning a peach orchard herein presented is taken from our own experience as fruit growers, and the knowledge obtained through the courtesies of the most successful peach growers of this state, and may well be regarded as strictly up-to-date. A peculiarity of the top is that it makes a greater growth, under favorable conditions than the root can maintain in full vigor, especially during its first fruiting years. Peaches naturally grow an open head, but in most cases it is necessary to thin for an open top, so that sunshine may reach the fruit, and produce color and quality. The first year after planting be careful to form your head in the right proportion and shape. Prune to secure a body 24 inches to the first limb on bearing trees. Prune to four or five main branches after the first year and these head in about one-third of past season's growth. The second and third year head in about one-third and remove the small growth one or two feet up on the large limbs. Aim to build up a strong framework, such as will carry a heavy crop of fruit. Remove suckers. Prune to umbrella shape, open in the center. Follow up the heading-in method right along, at first to build up a good tree, and afterwards for the purpose of thinning the fruit, which in most all cases is set much too heavy. **Thinning** by hand before there is too much growth of seed is absolutely necessary where large and fine fruit is desired. Thin so as to keep the fruit three to six inches apart. Apply ashes for fertilizer in liberal quantities, where the soil is deficient in potash, especially on sandy soil. For market select varieties of good size, fine color, high quality, and above all, hardy sorts and good shippers; varieties like "Banner," and "New Prolific," which will always command the markets, no matter how plentiful fruit may be. It will pay the reader to study into the high qualities and market value of these varieties and to read the indorsements of growers and authorities. See illustrations and descriptions.

The Quince Orchard

Prune in tree form. Remove suckers and dead branches. Trim in symmetrical form; thin out branches moderately in center when too crowded. Fertilize with rich stable manure; cultivate often; thin out when bearing too freely. Select a sandy or loamy soil.

The Vineyard

For a vineyard select a good, healthy, warm soil, well drained, and if possible, an elevated location; if sloping towards the south, so much the better. Run the rows north and south. Plant eight feet apart each way. Plow deep, or subsoil the ground before planting. Keep the soil well worked and use barnyard manure and ashes as fertilizer. Remove all sprouts com-

BLOCK OF ONE-YEAR-OLD STANDARD PEAR.

This block represents the finest growth we have ever produced in our nurseries. It is the ideal block of what goes to make up the best achievements in the production of the pear tree. A strong, healthy and vigorous growth; some of the trees, as will be seen, towering far above a man's head. This is a result of one season's growth on soil prepared under new and scientific methods. A triumph indeed over the old way of growing trees.

ing out of the ground on bearing vines. Train your vines on wire trellises. Tie up the vines at least three times during the season. Heading in the overhanging branches on bearing vines to ripen the wood and fruit should be done about August 15th. Place the posts for wire trellises 24 feet apart. Brace the end post securely. Fasten the wire with staples driven three-fourths the way in. Posts should be at least 8 feet long and set 2½ feet into the ground. Fasten the first wire 24 inches, the second 44 and the third 64 inches from the ground. Use No. 11 iron wire. Plow shallow up to the vines in the fall and away from them in the spring, and cultivate thoroughly during the summer.

Pruning Grape Vines

FIRST SEASON AFTER PLANTING. Cut back all young wood except two buds, allowing one of these to grow up.

SECOND SEASON. If the cane has made a growth of 4 feet or over the first season, cut down to within 2 feet of the ground, allowing no more than four or five of the upper buds to grow; all lower ones should be rubbed off during May. In case the vine has made but a feeble growth, it should be cut down again to two buds and treated same as the first season.

OUR GROUP OF CHAMPION BUDDERS.

An aggregation of skilled workmen in the art of budding trees. A small army of active people selected from the most reliable, skilled and intelligent help at the nursery. With this force we are able to bud about 48,000 trees per day. The budding season usually opens about July 5th and closes the latter part of September. One would hardly believe it possible for one man to insert 5,215 buds in ten hours' work, yet this remarkable feat was accomplished last season by one of our budders, with a growing record which proved to be about 90 per cent., thus breaking all previous records. Twenty years ago 1,000 buds per day was considered a big day's work for an experienced budder; to-day our budders average about 3,000 trees per day. Pray, have we kept pace with the progressive movement of the world? Have we improved our conditions?

THIRD SEASON. If the vine has made a strong and healthy growth the two previous years, two or three of the strongest canes should be left to produce fruit. These canes should be left about 2 feet long, starting at the first wire or a little below. In case the growth from the previous year is light, leave only two canes near the first wire about 12 inches long, all other suckers to be cut off.

After the third year good judgment should be used not to overtax the vine. Usually from 8 to 10 feet of young bearing wood evenly proportioned throughout the vine, either as **canes or spurs,** is about the right quantity of bearing wood to be left on a good healthy vine. One or two spurs three buds long should always be left near the first wire to produce new canes for the coming season. If trained for an arbor, all young shoots should be cut back to three buds after the fourth year; this produces a dense mass of wood and foliage and often an abundance of fruit of fair quality.

Currants and Gooseberries

One-third of the young wood should be cut off each year. Old stems which produce but little fruit should be cut out. On bearing plants remove all branches which hang over and touch the ground. Cultivate shallow and often. Apply rotted manure as fertilizer.

For destroying insects see Spraying.

Raspberries and Blackberries

Red Raspberries, also **Blackberries,** should be allowed to grow in matted rows. In old patches it is necessary to thin the plants in the row to permit free access of air and sunshine, allowing only those plants of strongest fruiting power to remain. **Black Raspberries,** also **Dewberries,** should be grown in hills. After fruiting all old canes should be removed, cutting them close to the ground. Stable manure should be applied in the fall in order to keep up the vitality of the soil. Prune during March. Red varieties of raspberries, also blackberries, should be pruned back to two and one-half feet from

OUR MAMMOTH STORAGE CELLARS.—LARGEST IN THE WORLD.

These grand storage buildings give an interesting example of modern genius in the storage and care of nursery stock. They are five in number, built of quarried stone and representing the investment of large capital. Total area of storage room 77,000 sq. ft., being the largest in the world; capacity over three million trees. With the facilities we have for the perfect storage of stock, we are prepared to meet emergencies arising from shipping stock during the winter and late in spring. Stock is handled and packed in these buildings without exposure to sun, wind and frost. The carelessness among nurserymen generally in handling trees, if seen by planters would prove a big surprise. Live trees are handled too much like brush from the clearings. Is it a wonder that there are so many disappointed planters?

the ground. On the black raspberries and dewberries allow from 5 to 6 canes to stand for fruiting two and one-half feet long. Red varieties of Raspberries are not as long-lived as black sorts, and usually require replanting on new ground after three or four crops have been taken off. A sandy, black or gravelly loam is best. To prevent rust on Blackberries use Bordeaux mixture (See Spraying). Cut out all diseased canes. **For profit the Conrath Raspberry leads them all; it is early, very large, hardy, etc. See colored illustration.**

Strawberries

The soil for Strawberries should be made very rich. A sandy or gravelly loam is best, a black loam next, then clay. For heavy soils only the most vigorous growers should be selected. Strawberries are of two classes, the Pistillate and the Staminate. Pistillate sorts are destitute of the stamens and require a row of Staminate (or perfect flowering) sorts to be planted among them at intervals not exceeding a rod; the former, if properly fertilized with good, perfect flowering sorts, are more prolific than those with perfect flowers, or the sorts known as Staminate. For field culture set in rows 3½ to 4 feet apart, 12 inches in row; for garden, 15 inches apart each way, leaving pathway every third row. To produce extra fine large fruit, keep in hills, pinching off all runners as soon as they appear. Apply rotted barnyard or vegetable manure, such as muck, rotten turf, wood soil, clover or some other green crops turned under, also some ashes. In the fall, after the ground is frozen, spread a good covering of straw or leaves over the plants for protection during the winter and remove the covering before growth starts in the spring. We advise early spring planting. The first season all blossoms should be removed, so as to throw the entire vigor towards producing plants for the next season's crop. Usually after one crop is taken they should be plowed up, unless the plants are healthy and appear to be able to bear another crop. Old patches of Strawberries do not pay.

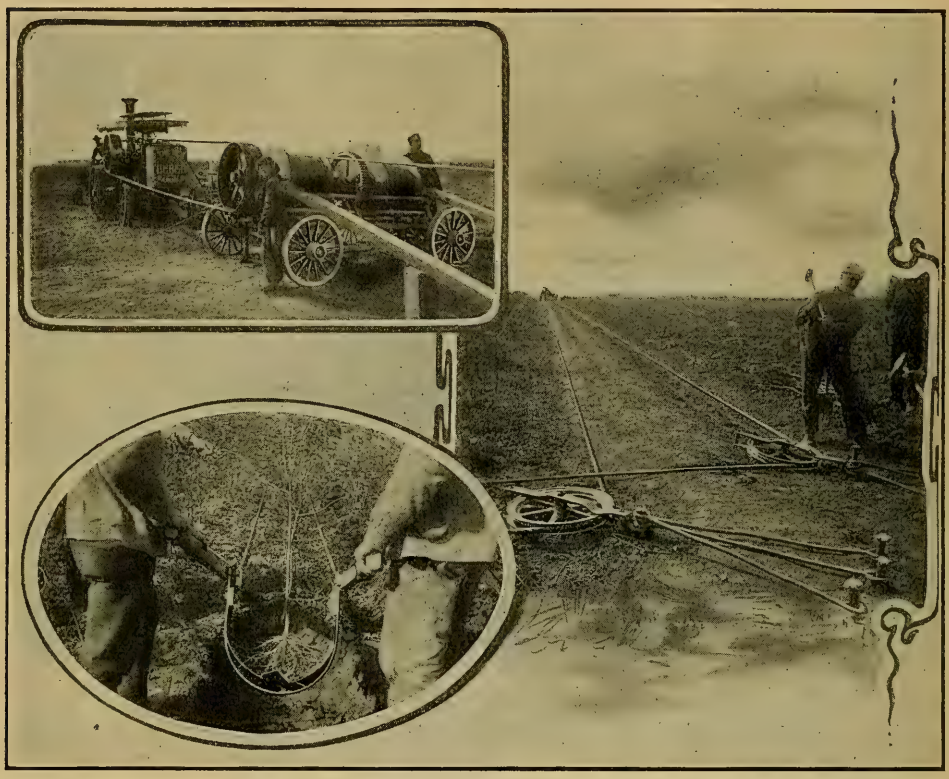
HARVESTING 100,000 TREES IN ONE DAY.

We are pleased to show herewith a photograph of many wagons loaded with trees coming from the field, on Nov. 11th, 1903, the day we dug and cellared over 100,000 trees in less than 10 hours' time. This achievement exemplifies the possibility of digging trees under modern methods, as illustrated on next page.

Chapter Three — TREATISE ON MARKETING FRUIT

Hints on Marketing

The subject of Marketing is one of great importance. Many who are successful in growing fruit for market often fail in marketing their products. Few realize the importance of looking up a market before shipping time. If you have a good home market you should make the proper use of it and deal honestly with your patrons, thereby creating a demand for your products. If you depend on shipping your fruit, find a well known and established house in whom you can place your confidence and give them all the business you can. Don't overlook the value of a home market, if you have one, and don't refuse a reasonably fair cash offer for fruit in the orchard. Be cautious in shipping to unknown parties. Treat with mistrust letters of alluring and tempting character. Try to keep posted on the market. Read one or more Horticultural papers; they are the best instructors as to demand and supply. Send 50 cents for one year's subscription to the **North American Horticulturist,** a monthly fruit growers' Journal, published by us. Don't wait until the last moment before deciding what kind of package you are to use. It is poor economy to hire cheap, green and unreliable help for picking and packing. Never tolerate rough and reckless handling of packages containing fruit. Haul fruit in a spring wagon. Ship directly after picking, as every moment's delay decreases the value of fruits. Stamp your name and address on every package; mark on the outside of every package the variety contained. Avoid shipping soft fruits, such as berries, so as to reach the market on Saturday evening or Sunday morning. Remember that good choice fruit, well handled, properly graded, and neatly put up will always sell at good prices. Aim to grow such fruit, and then put it up in good shape. Ship in refrigerator cars if it is possible to obtain them, all kinds of small fruit, including peaches, plums and cherries, especially for distant points. Fruit dealers are not fools, and it is a difficult matter to deceive them



OUR STEAM TREE DIGGER AT WORK.

These photographs give a comprehensive idea of the workings of our "Steam Digger." These pictures were taken on Nov. 11th, 1903, the day we dug and cellared over 100,000 trees, showing the digger in full operation. The complete cost of this machine is over $3,000, and as far as we know there are only four in use at the present time.

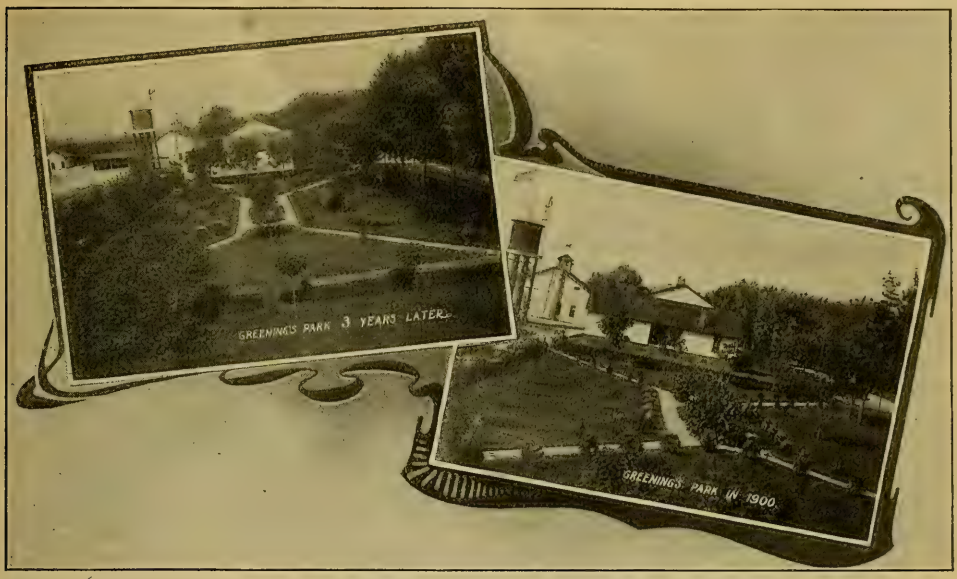
by dishonest packing. Establish for yourself a reputation for good and honest grading and packing. Secure strong and neat packages of full measure; don't try to pass off a short measure for a full one. In very warm weather cut holes in tight packages in which you are shipping fruit, for circulation of air. Give good full measure. Grade closely, pack honestly, pick carefully; sort out bruised fruit, and never mix windfalls with hand-picked. All fruits should be hand-picked and handled to avoid bruising. Windfalls should be marked on the outside of the package, as such. When packing in barrels, kegs or boxes, shake gently when half full and repeat when nearly full, to settle the fruit.

MARKETING APPLES. Gather when ripe, before they drop or are blown off by the wind. Use good judgment as to the right time to gather. If picked too soon, poor flavor and wilting of the fruit will be the result; if left on the tree too long, they will drop off and cause loss. The proper time for gathering Winter Apples is from September 25th to October 10th.

Place the fruit in barrels or boxes, put them in a cool, dry place, and let them remain open, standing on end, until ready for shipment; then empty carefully on straw, hay or blankets, re-sort and pack all sound fruit in barrels. Another method is to put them under cover in a shed or barn until there is danger of freezing, when they should be barreled up or put on the shelves in a cool cellar. Mark the variety and the grade on the end intended for the head. Use windfalls and culls for drying, cider, jelly or vinegar.

MARKETING PEARS. Gather before they are ripe and soft, while yet firm. Early varieties soften quicker than late, and require quicker handling. Strong crates, either half or full bushel, are best for shipping pears. Make two grades, and don't ship culls. Plant the best varieties, such as **C. de Nantes, a variety that brings big money,** late in the fall. Ripen Winter Pears in a dark cellar.

MARKETING PLUMS. Plums are classed with soft fruits and must be handled accordingly. Many of the European sorts are very poor shippers, and growers



OUR PRIVATE PARK SYSTEM.

are pleased at the introduction of a class of Plums that can be shipped safely to distant markets, namely, the **Japan sorts.** We have kept "Burbank" and "Wickson" plums on shelves in the office for 30 days during warm weather. Pick before getting soft. Use a strong, stiff Climax basket, either one-fifth or quarter bushel. If shipped in large baskets, they rarely ever reach their destination in good condition. Fancy or large fruit should be wrapped in tissue paper and shipped in shallow baskets. Unless you have through freight lines, affording direct and quick transportation, we would advise shipping by express.

MARKETING PEACHES. The peach business has undergone somewhat of a revolution the past 8 or 10 years. Ten years ago early sorts were considered the most profitable; lately early sorts have not only proven a failure in market but in many cases it would have paid the grower to let them rot on the trees rather than to have shipped them. We write thus to impress the reader with the importance of planting varieties that are firm, and good shippers. Such as Banner, New Prolific, Smock, Mathew's Beauty, Elberta, etc., are best for distant markets.

GRADING AND PACKING PEACHES. We wish that we were able to put it down in words strong enough so that it would be fully understood by growers of peaches, how important it is that the grading and packing be done straight and carefully; also that the fruit should average evenly throughout the package in size and quality. How many growers curse the commission merchant, when they are often to blame themselves. Few realize that failures in fruit growing are often the result of crooked and careless packing. The handling, packing and marketing of fruit has become a science, and the sooner fruit growers find this out the more successful they will be in marketing their fruit products. Pick carefully by hand. Handle with greatest care, grade every package, no matter how nice they appear on top. Bring under shelter and grade from benches or use a **Peach Grader.** In packing shake the package gently from time to time until filled. Ship only two grades; and mark each grade on the outside of package. Sell or ship immediately after packing. Haul with spring wagon. Throw away all decayed and soft fruit rather than mix in and spoil the sale of good fruit. Go over your trees at least three times, picking the best colored and ripest each time. Consult dealers and shippers as to kind and size of package to be used, and get a full supply in time to avoid disappointment and loss in the shipping season. Cover fruit with a cloth to keep off dust and sun while hauling it. Sell all you can at home if you can get fair prices, and ship the balance.

MARKETING CHERRIES. Pick with stems on before fruit is too ripe. Deliver or ship the same day when picked if possible. Use shallow baskets or crates for shipping. For the large Sweet Cherries good prices can be obtained if packed in small baskets to imitate California packages; nearly double the price and often

OUR PRIVATE PARK SYSTEM.

more may be secured in this way. We notice that a few enterprising Michigan fruit growers are using this method of packing with great profit. The Brusseler Braune Cherry, which we have introduced recently, ripens two weeks later than the latest known cherry; it is of the largest size, fully as large as the big sweet varieties, dark brown, very productive and a very hardy tree. It will be planted extensively in the future.

MARKETING QUINCES. Pick when golden yellow; handle as carefully as peaches, as every bruise will turn brown and spoil the looks of the fruit.

MARKETING GRAPES. Gather when fully colored and sweet. Too many grapes are picked too green, and are a great detriment to the market early in the season. Unripe grapes are injurious to health, and are relished by no one. While picking handle very carefully, lay them gently into the basket. Use a strong stiff basket, eight or ten pound. Two pickings should be made, as those most exposed to the sun will ripen first. Use a spring wagon for hauling. Grapes may be kept for a considerable length of time after picking, even into the winter if handled with proper care, and if kept in a cool cellar or storage, where the air is not too damp, and the temperature even.

MARKETING BERRIES. Provide neat crates and baskets. Do not be tempted to use a dirty basket or crate, even if given you. In selling, everything depends on having fine, large fruit put up in attractive packages. Give each picker a stand, which can be made of lath, to hold four quart boxes, and instruct them, and see to it that they handle the berries much more carefully than they would eggs. If you have a good variety and have cared for them well, there will be very few small ones. Round up the box well and turn the stem ends of the top strawberries down. This gives a showy appearance, and is much better than topping off with extra large ones. Customers like to receive a full quart, and just as good berries at the bottom as at the top of the basket. For a market one hundred miles or more distant, berries **must** be picked in a very firm and partially green condition and shipped per express. This condition can only be learned by experience. If possible, engage one party to take all your berries at a uniform price. An enterprising groceryman for your home trade, or a reliable commission merchant if you are obliged to send to a city. You will not be likely to make a bargain in advance with a commission merchant unless your berries are well known to him. In a home market it is a great advantage to be able to deliver your berries and have them off your hands. Women are preferred as pickers, then girls, then boys. To have picking well done requires close supervision. To be successful, your picking must be well done at any cost. Avoid jolting in carrying berries to market or depot. Have commission men report condition on arrival, and bring every influence to bear on railway and steamboat men to have them handle the crates carefully.

MARKETING CURRANTS. Pick when fully ripe, and ship either in one quart boxes, the same as berries, one-half bushel shallow crates or boxes, or Climax grape baskets.

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Some of our artistic compositions, presenting very attractive views as seen from the highway.

MARKETING GOOSEBERRIES. Pick just before they begin to ripen, while yet green. On account of their strong and tart taste they are very desirable for canning, pies and jelly. They also make one of the finest and most palatable catsups of any fruit grown; if this is new to you, "try it," and you will be surprised. When the fruit is left to ripen on the bushes, the berries are very sweet and delicious, and there is occasionally a demand for ripe berries; it is always well to find out from the merchant who handles your gooseberries whether he wishes them green or ripe. One of the best packages to use in shipping gooseberries is the Climax 10-pound grape basket; one-half bushel crates or boxes are also very desirable. To clean gooseberries, after being gathered, run them through a fanning mill, with cloth over the sieves. Gooseberries may be shipped long distances.

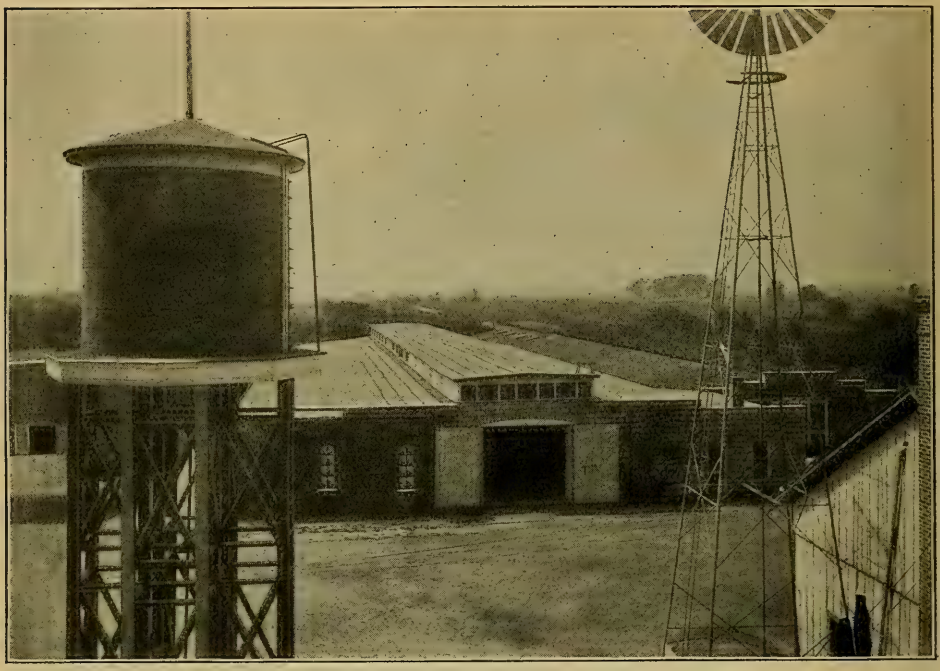
Chapter Four — TREATISE ON BEAUTIFYING THE SURROUNDINGS OF THE HOME

IN PRESENTING this chapter on home improvement, the writer has in mind the arousing of the public interest, the awakening to the necessity of more pleasant surroundings, and particularly a dispensation of information that an enterprising public is very much in need of. Our office is besieged with inquiries from people desiring information and ideas of how to lay out front yards, lawns, etc., and the kinds of trees and plants best suited for this purpose. Believing that the duty to give this information rests largely with the nurserymen, and desiring to fill a long felt want, we are pleased to embody in this book a treatise giving practical ideas, in very brief and comprehensible form, along this line of work.

The Front Yard

HOW SHALL WE IMPROVE AND BEAUTIFY THE FRONT YARD? Let us see. The ideal front yard should have an open, grassy front, which, like a picture, should have its borders and edges framed, and trimmed with suitable plants and trees so as to give an attractive and pleasing effect.

The central feature of the front yard, to which all parts relate, is the residence. Let us begin by planting beds of hardy flowering shrubbery right up against



Bird's-eye view of our main Storage Cellar, covering an area of over 77,000 square feet, built of quarried stone, the largest and most costly building of its kind in the world. Its storage capacity is over three million trees.

the house in front, on either side of the entrance, and along the sides of the house where it will show from the front. For this purpose hardy shrubs are most desirable, for the reason that they are permanent and may be pruned in any form desired. Those most suitable for this purpose are the **Spireas:** Van Houtii, Thunbergii, Bumaldi, Reevesii, Prunifolia; also Barberry Thunbergii, Deutzia Gracilis, Globe Flower, Hydrangea, Red Snowberry and Syringa Golden. They should be planted two to three feet apart. If a banking of tender flowers is desired, plant beds of Geraniums, Cannas, Caladiums, Asters, Nasturtiums, Heliotrope and Peonies. A hedge of Arbor Vitae, or a double row of mixed hardy shrubbery, should be planted along the edge of the lawn as a border for the sides and background. A group or border may also be dominated by any one kind of shrubbery chosen from some of the nursery catalogues. A row of Maples, Birches, Catalpas or Mountain Ash should be planted along one or both sides of the driveway leading to the barn. A spacious front yard should have a few trees scattered about in such a manner as not to obstruct the front view or detract from the beauty of the lawn. The following are most suitable: Cut-leaved Birch, Catalpas, Mountain Ash, Prunus Pissardi, Purple Fringe, Sweet Gum, Maiden Hair, Magnolia, Weir's Cut-leaved Maple, Laburnum, Purple-leaved Beech; also Weeping Elm, Tea's Weeping Mulberry, Kilmarnock Willow, etc. Don't overcrowd or make the front yard look like a checkerboard. The banking of shrubbery and flowers up against the house is in most cases amply sufficient to add beauty and grace to the front of the house. Evergreens of the fancy varieties may be arranged in the background, either singly or in groups for fine effects. The varieties best suited for a heavy background are the Norway Spruce, American Arbor Vitae, Red Cedar, Colorado Blue Spruce, etc. The slower growing varieties, such as Tom Thumb Arbor Vitae, Hovey's Golden Arbor Vitae, Siberian Arbor Vitae, Chinese Compacta, Irish and Golden-tipped Juniper, are best suited for planting singly or in clusters. All of these may be pruned in any desired shape to please the taste. Climbing roses, Clematis and vines should be grown on wire trellises near the porches or on buildings around the place, or around the windows or doors, so as not to exclude the sun and air. We herewith give a list of shrubbery inclined to grow tall, which may be used to plant along the border of the lawn, either singly, in groups or hedge-rows. Purple Barberry, Flowering Currants, Deutzias, Dogwood, Golden Elder, Purple-leaved Filbert, Forsythia, Upright Honeysuckle, Golden

GREENING'S BICYCLE PATH.

Constantly having in mind the improvement of the highways, we have built at our expense a bicycle path leading from the city to our nursery grounds and office, a distance of one and one-half miles. It is constructed of ground limestone, is as smooth as a floor, and is kept in perfect condition at our expense. It is conceded by many that this path is one of the finest in the country. It is the delight of cyclers, and many fast records have been made on it.

Spirea, Spirea Van Houtii, Lilac, Double Flowering Plum, Snowballs, Snowberry, Syringas, Weigelias, etc. The best creeping plants for brick or stone walls are the Ampelopsis Veitchii (Japan Ivy). Other climbing plants best suited for screening or covering buildings, fences and unsightly objects are the Honeysuckle, Dutchman's Pipe, American Ivy, Akebia, Wistaria, Trumpet Vine, Clematis Paniculata, Cinnamon Vine, etc. Rose beds may be planted on the sides of the lawn or in other places where they will get plenty of sunlight. Attention is directed to the beautiful illustrations showing the splendid improvements made around our own homes, buildings and parks here at the nursery. Those seeking knowledge along these lines are cordially invited to visit our grounds, where they may get ideas that cannot be obtained in any other way.

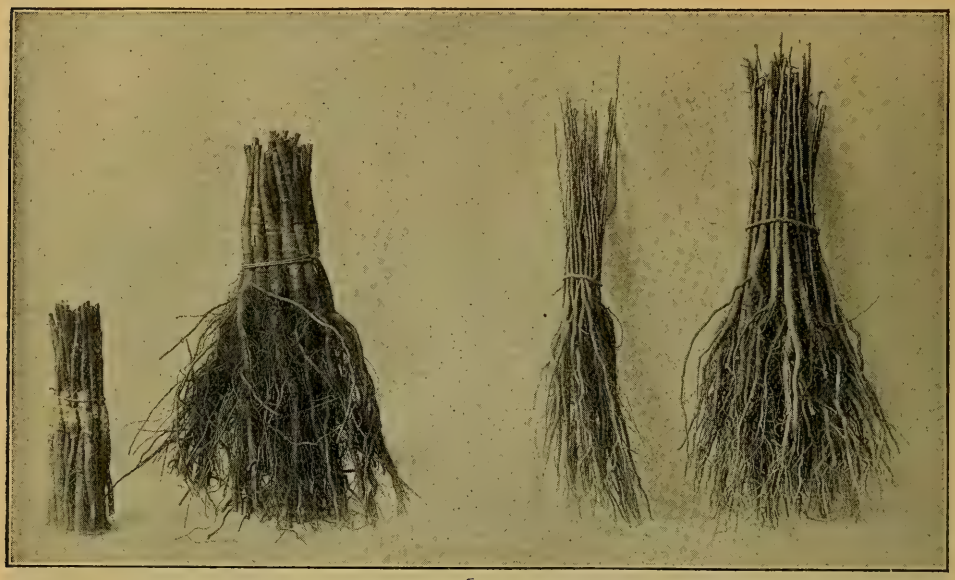
The Lawn

First of all, let it be understood that the front lawn must not be used as a temporary driveway or convenient place to store wood, rubbish or ancient machinery. The ground for a lawn should be carefully prepared and enriched. It should be graded to a pleasing slope and sown with lawn grass. For a farm lawn, sow with one quart of Kentucky blue grass seed to the square rod. The surface must be even and the soil mellow. It should be rolled and mowed frequently. Water should be applied freely by means of a sprinkler wherever possible. The size of the lawn should correspond to the dimensions of the house and its distance from the highway.

The Back Yard

We ought to perhaps offer an apology for not placing this section pertaining to the improvement of the back yard at the head of the list. In many cases there are ample reasons why the work of home improvement should begin in the back yard. The first thing to do is to clean up. Remove stones, litter, rubbish, and everything unsightly that is movable. Find a suitable place for the woodpile, level the ground, take down broken fences and build new ones. Plant climbing vines against unsightly buildings, or make a screen of evergreens, or plant tall growing shrubbery, to hide unsightly objects in the back yard.

Round out the corners of the lawn with graceful shrubbery.



Piece-Root Grafts. | Whole-Root Grafts. | No. 2 Seedlings. | No. 1 Seedlings.

PIECE-ROOT VS. WHOLE-ROOT TREES.

Above is shown the piece-root and whole-root graft, also No. 1 and No. 2 fruit tree seedlings. Each one of the bundles contains the same number of grafts and seedlings. The superior value of whole-root trees must be readily apparent, even to the inexperienced, still there are nurserymen who will argue that piece-root and No. 2 seedlings are equal to whole-root and No. 1 seedlings. We use only the strongest whole-root stock and the results are most gratifying.

Walks and Drives and Where to Put Them

Put them where they are needed, but be sure that they are needed. Go from one point to another in the easiest and simplest way possible. If you can throw in a gentle curve, it will enhance the charm of it. For driveways use gravel, cinders, stone screenings, or tan bark. For walks, cement and stone flagging are the best materials; the next best are gravel, planks, screenings and cinders. Wooden walks should be sunk on a level with the sod so that the lawn mower may pass over without hindrance. In flower gardens a strip of sod may be left as a walk.

The Fence Question

There should be no fence in front of the premises unless there is a reason for it. They are neither ornamental nor desirable. The money put into a fence will often buy enough stock to plant the whole yard. The street and walks sufficiently define the place. In the back yard there may be need for a fence, which may become both a screen and a shelter. Usually it can be covered with creeping vines or grape-vines.

Hedges

Hedges add beauty to a lawn or park as jewelry does to good dress. Repeated and careful pruning are leading essentials which must be observed to maintain a well-kept hedge. The leading varieties of evergreens for hedges are: American Arbor Vitae, Norway Spruce and Red Cedar. Among the shrub hedges, the following are the most valuable: Privet, Japan Quince, Purple Barberry, etc. All of these may be pruned into any desired shape.

In conclusion, it is the hope of the writer that his efforts in compiling this work may lead to higher ideals, greater happiness and more complete enjoyment of life.

OVER 500,000 PEACH TREES IN BUD IN ONE SOLID BLOCK.

An ocean of trees, yet only a small portion of our annual output. Our peach trees are grown from the genuine natural peach seed, gathered for us under contract in the mountains of Tennessee. Trees grown from this seed have all the health, vigor and hardiness of the natural stock retained and preserved, and will make profitable and lasting orchards. The average height of trees in this block when photographed, at 4 months old, was about 4 feet; such wonderful growth being the result of turning under two heavy crops of cow-peas and a liberal application of stable manure.

Chapter Five — TREATISE ON TREE INSECTS AND DISEASES, SPRAYING, ETC., ETC.

By PROF. L. R. TAFT and C. E. GREENING

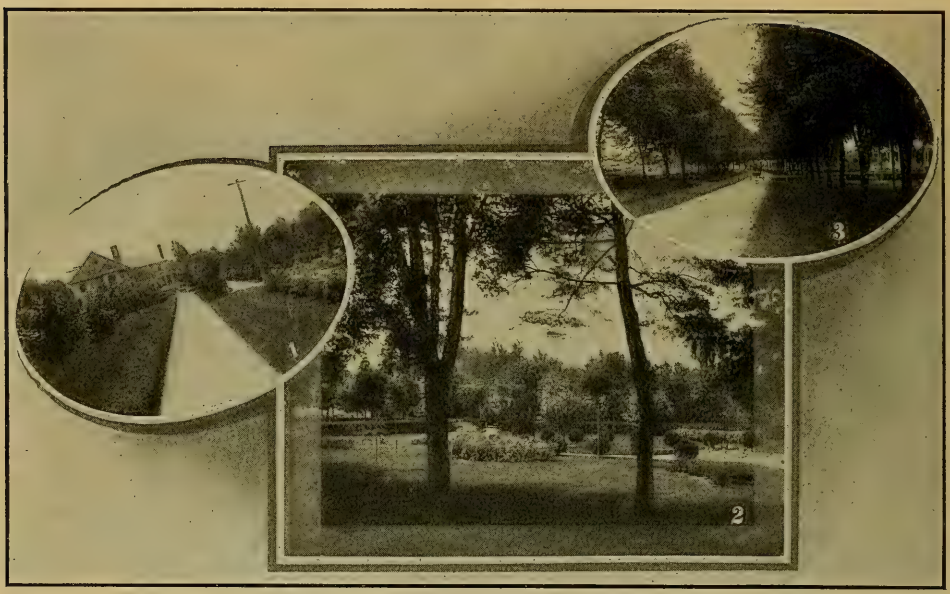
SPRAYING.—Get a spraying apparatus of a size commensurate with the area of your orchard. In the use of the various solutions, much care should be given to their proper strength and to the purity of the chemicals. See that the solutions are kept continually stirred. Use clean water. Run the solutions through a screen. Mount the apparatus on a cart or wagon. Use the celebrated "Vermorel Nozzle." Use a strong hose of sufficient length to spray one or more rows at a time. For large trees use an extension rod to elevate the nozzle up into tree. Write us for low prices on a first-class spraying outfit.

Destructive Insects and Remedies for Them

The insects which injure trees and plants obtain their food either by biting off and swallowing portions of the more tender parts, or by sucking the sap through a slender tube, and the remedies selected must be adapted to the habits of the insects. Thus most of those in the first group can be destroyed by covering the sections on which they feed with Paris green, while for the sucking insects something must be used which will act upon the breathing organs, or have a caustic effect upon the bodies of the insects.

CODLING MOTHS.—These attack the apple, and occasionally the pear and quince. There are two broods, one of which hatches in June and the other in August. Spray with the Paris green mixture soon after the blossoms fall, while the calyx lobes are still open, for the first brood, and the latter part of July for the second brood.

PLANT-LICE, APHIDES, ETC.—These are sucking insects. Use kerosene emulsion, strong tobacco-water, or whale-oil soap. As a rule, they are most plentiful in hot, dry seasons.



OUR PRIVATE PARK SYSTEM.

Fig. 1 illustrates one of our picturesque macadam driveways. Fig. 2 shows an effective display of shrubbery, trees, and Tom Thumb evergreens with an attractive background. Fig. 3 gives a fine view of our charming Silver Maple avenue.

SAN JOSE SCALE, SCURFY SCALE, OYSTER-SHELL SCALE, AND OTHERS.—These are also sucking insects, but differ from ordinary plant-lice by secreting a shell-like covering. They travel but a short distance after hatching. Most of them have but one brood, but the San Jose scale may have three or four broods in a season, and multiplies so rapidly that millions of San Jose scale may come from one female insect during one season. **The oyster-shell scale** is one-fourth inch long, brown in color, and of about the shape of an oyster-shell. The scurfy scale is gray in color, flattened, and nearly the size of a pin-head. San Jose scale is much smaller, resembling small black "fly-specks," so small that it is rather difficult to detect them until one becomes familiar with their appearance, except when numerous; they can be more readily distinguished with a magnifying glass. When first hatched, their color is yellow and they move about very rapidly, but in a short time a scale-like covering begins to form, resembling fly-specks.

REMEDIES FOR SCALE-INSECTS.—For San Jose scale use the **"sulphur, lime and salt mixture,"** prepared as follows: Twenty-five pounds of lime, 15 pounds of sulphur, 8 pounds of salt. Slack the lime, which should be fresh, in warm water, and keep stirring to avoid burning. When the slacking begins, sift on the sulphur and mix thoroughly. After slacking and mixing, add enough water to make a thin paste, and boil from one to two hours; then add the salt and continue the boiling for fifteen minutes, then add enough hot water to make fifty gallons. Mix thoroughly, run through a strainer and apply the mixture while hot. This remedy should be used only while trees are dormant, March being the best month. For a summer application for the destruction of the San Jose scale, prepare this mixture in the same way, leaving out the salt. The spraying should be done very thoroughly, so as to cover every part of the branches infected by the insects. In sections where the San Jose scale prevails, an application of the above mixture should be made each year. For the **oyster-shell** and **scurfy scales** a good remedy is to spray the trees during the winter with 6 pounds of caustic soda in 50 gallons of water.

PLUM CURCULIO.—In addition to the plum, this insect attacks the peach, cherry and apple. The insects are beetles, one-eighth inch in length and brown in color. The beetles appear often before the blossoms open, and as they feed on the leaves, it is possible to poison by spraying at that time. As soon as the blossoms have fallen the spraying should be repeated, and another application is often advisable, especially in rainy seasons or when the curculio are numerous. **Formula for spraying:** Slack 2 pounds of fresh lime and mix thoroughly with 1 pound of pure Paris green in 150 gallons of water. For most purposes it is desirable to combine

THE FLYER "BAB," PROPERTY OF CHAS. E. GREENING.

the Paris green with Bordeaux mixture. Keep the water and poison constantly stirred. Apply thoroughly. Jarring the trees in the early morning and catching the beetles upon sheets spread on the ground, is also an old and effectual remedy.

CURRANT AND GOOSEBERRY WORMS.—Spray with Paris green, 1 ounce in 15 gallons of water, with a little lime, as soon as the worms appear. For the second brood use powdered hellebore, and later pyrethrum, if necessary.

BORERS.—Nearly all fruit trees are subject to the attack of borers in the trunk near the ground. Examine the trees during October by scraping the soil back from the trunks to a depth of three inches. If borers are found, destroy them with a steel wire or dig them out with a knife. Peach and other trees, especially subject to attack, should be again examined in May or June.

CANKER-WORMS.—Apple orchards, elm and other trees are often defoliated and their growing and fruiting prevented by this insect. When full grown they are about one inch long, and of a light green color, and from their appearance when crawling are often called inch- or span-worms. They often consume all of the green portions of the leaves, only midribs remaining, and the trees have the appearance of having been scorched with fire. **Remedy:** Spray thoroughly with the Paris green mixture just before the blossoms open, and again as soon as the fruit has set. In rainy seasons several applications may be desirable. While small the worms are readily killed, but if the spraying is delayed until the worms are nearly grown, a more thorough application of the poison than usual is necessary. A band of sticky material, such as fly-paper, if wound around the trunks to act as a trap for catching the worms when they emerge from the ground in the early summer and begin to travel up the tree in search of food and to deposit their eggs, is also a splendid remedy.

SLUGS.—These are small, slimy insects about one-half inch long, that eat the lining off the leaves of cherry, pear, plum and quince trees. There are usually two broods, which may readily be destroyed by throwing dry road-dust, slacked lime or ashes over the trees, or they may be sprayed with the Paris green or Bordeaux mixture.

Diseases of Fruit Trees and Their Remedies

PEAR BLIGHT.—This disease causes the leaves and twigs to turn black, and it may be spread all along the branches until the entire tree is involved. The remedy is the removal of the affected portions as soon as the disease is detected. We also recommend using the California tree-wash, and scraping the bark, as herein described under the heading of "The Pear Orchard." Also use the sulphate of copper mixture as directed.

GREENING'S ADVERTISING WAGON.

Few people realize the vast proportions of our advertising. Our claim of being the largest advertisers among nurserymen in the world is fully justified. Above is shown one of our advertising wagons, fully equipped for painting our signs on large buildings throughout the country. Four expert artists accompany each wagon. Each wagon carries an abundant supply of Greening's literature, such as catalogues, pamphlets, Horticulturists, etc., all of which is distributed en route as they travel through the country.

THE APPLE AND QUINCE BLIGHT.—This is a form known as twig blight, often attacking the young growth upon apple and quince trees. The removal of the affected portions is the only remedy, but we would advise a thorough application of the Bordeaux mixture in every case of blight of this nature.

PEACH-LEAF CURL.—This is a fungous disease which causes the leaves to thicken, curl and fall off. The disease is most troublesome when the weather in May is cold and wet. **Remedy:** Spray the trees early in the spring before sap flows, with a solution of copper sulphate, using 2 pounds in 50 gallons of water. Spray thoroughly so as to cover every bud. This remedy has proven very effectual.

PEACH YELLOWS AND LITTLE PEACH.—These diseases are very contagious, and the only method of saving orchards is the prompt removal of the affected trees.

SHOT-HOLE FUNGUS, OR LEAF BLIGHT.—This disease is the most injurious to the plum of the European varieties. It also affects the cherry, currant and gooseberry. Brown spots appear on the leaf, causing the injured portions to drop out, making round holes in the leaf, and finally causing the foliage to drop, long before the growing season is over. This check causes the tree to ripen its wood, and a little later in the season they begin to throw out new foliage, which in many cases proves fatal to the tree. **Remedy:** Spray with a solution of copper sulphate, using 2 pounds in 50 gallons of water, early in the spring before the sap begins to flow. Later on the Bordeaux mixture may be applied several times during the growing season.

BROWN ROT OF STONE FRUITS.—This is a rot affecting the fruit just before it begins to turn, and often destroys the entire crop. Warm, wet and muggy weather aids the disease in the germination of the spores of the fungus. **Remedy:** Spray with the copper sulphate solution early in the spring before sap flows, and continue to spray with the Bordeaux mixture every three or four weeks up to the time the fruit begins to color, the last spraying being with a weak solution of copper sulphate, containing about 1 pound in 150 gallons of water.

APPLE SCAB.—Use Bordeaux mixture every four weeks after the fruit has formed on the trees. Three applications are sufficient.

Trees, shrubbery, flowers and sunshine, fill the heart with joy.

RESIDENCE OF CHARLES E. GREENING.

In architecture this building is after the modern English type. It has a frontage of seventy-five feet and extends sixty-five feet to the rear. The interior is finished in selected polished Tennessee quartered white oak; French plate glass, conservatory, billiard parlor, fine library and private gas plant, a modern house with everything that will add to comfort and pleasure. An ideal home, amid charming groups of Spirea Van Houtii, stately maples, beautiful shrubbery and climbers.

Spraying Formulas

BORDEAUX MIXTURE.—Five pounds copper sulphate, 5 pounds stone lime, 50 gallons of water. Dissolve the copper sulphate by suspending it in a basket, so that it will hang just below the surface of the water. A gallon of water will readily dissolve a pound of copper sulphate. In another vessel slack the lime,—which should be fresh,—in eight gallons of hot water, stirring and adding cold water enough to keep the lime from burning. After the latter solution has cooled, slowly turn it into the copper sulphate solution and add enough water to make 50 gallons all told. This, when all is thoroughly mixed and carefully strained, is ready for use. The use of lime with this mixture is of the greatest importance, and we would rather advise a little surplus, so as to make sure of there being enough. For late spraying, in using this mixture, just before fruit begins to color, reduce the amount of lime and copper sulphate, in order to preserve the color of the fruit.

COPPER SULPHATE MIXTURE.—Dissolve 1 pound of copper sulphate in 25 gallons of water. This solution is only to be used in the spring, before the sap begins to flow. Do not apply it to foliage.

KEROSENE EMULSION.—One gallon kerosene oil, 1 pound of hard soap, and 15 gallons of water. Dissolve the soap in 2 gallons of water, add the kerosene and churn thoroughly together, until it becomes a thick, creamy mass. When ready for use, add the remainder of the water. This mixture will answer for nearly all plants, but for trees infested with plant-lice, it will be advisable to use 10 quarts of water to one of kerosene during the summer.

PARIS GREEN MIXTURE.—Use 1 pound of pure Paris green in 150 gallons of water. Add to this 2 pounds of well slacked lime. Strain carefully before using. For most purposes, we would advise combining the Paris green with Bordeaux mixture, in which case the extra 2 pounds of lime mentioned may be left out, on account of the lime contained in the Bordeaux mixture.

WHALE-OIL SOAP MIXTURE.—This mixture may be used for aphis and plant-lice during the summer season, at the rate of 1 pound of the whale-oil soap in 3 to 5 gallons of water.

Language of the flowers—"Kiss me over the garden gate."

Prominent Horticultural Societies Visiting Greening's Nurseries

Over 500 prominent Horticulturists who visited our Nurseries in 1898, bringing their own band.

Lucas County Horticultural Society; Lucas County Floricultural Society; Lenawee County Horticultural Society and the Civic Improvement Society of Monroe, Mich., visiting our nurseries June 19th, 1902.

The Michigan State Horticultural Society visiting Greening Bros.' Nurseries Oct. 8, 1901.

The three groups above shown are photographs taken on our grounds and represent gatherings of Horticultural Societies who came for the purpose of visiting and inspecting our Nurseries, seeing and admiring the beautiful and expensive improvements such as can only be found on our grounds. What they saw is expressed in the remarks made by some of the leading members of the society during and after the tour through the Nurseries.

HERE IS WHAT THEY SAID.

"I never believed these Nurseries were so extensive."—"The healthiest and smoothest trees I have ever seen."—"What perfection of detail on every hand."—"Such rich and glossy foliage."—"What a grand invention, the Steam Tree Digger—such fine roots I never saw." "What wonderful progress these people have made."—"What immense quantities of trees, extending for miles."—"There is no evidence of any disease or injurious insects."—"If I were to buy thousands of trees I would get them from this Nursery."—"I never heard of any yellows in this section," says Prof. Taft. "These people are certainly among the most successful Nurserymen in this country."—"The nature of that soil and the way it is prepared can only produce the very best trees; not a weed to be seen on these extensive grounds covering over 700 acres."—"What elegant and costly buildings and beautiful parks."—"I shall never forget this trip; it has been one of the greatest enjoyments of my life to visit these grounds."—"All that is represented in their catalogue and more too."—"They deserve success and are getting it."—Etc., etc.

Some of these visitors, to whom we respectfully refer the public: President R. M. Kellogg, Three Rivers, Mich. Secretary C. E. Bassett, Fennville, Mich. Prof. L. R. Taft, Agr. College, Mich., Sec. Ohio H. S.—W. W. Farnsworth, Waterville, O. C. J. Monroe, South Haven, Mich. L. B. Rice, Port Huron, Mich. C. B. Welch, Douglas, Mich. Prof. U. P. Hedrick, Agr. College, Mich., etc.

From a fifty-acre orchard R. Morrill received $30,000 for one crop. Does it pay?

THE OLD WAY OF DIGGING TREES.

An every-day scene in digging time under the old method of digging trees with spades. The men have succeeded in lifting the tree, with a mighty effort so frequently necessary to pull the tree, but alas! the tree being rent from the ground with spade and force of muscle, the roots are badly broken and bruised and it will be seen that the man pulling the tree has lost his equilibrium at a critical moment. Thousands of planters will hail with delight the advent of modern tree digging. There can be no disappointment in planting our steam dug trees, as all the roots are intact and uninjured, not bruised, broken or crushed as is the case under the old method. Results—smiling patrons, more business, better orchards.

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BIRD'S-EYE VIEW OF GREENING'S MAMMOTH NURSERY PLANT.

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